Subject: [PATCH 0/4][cryo] Test pipes
Posted by Sukadev Bhattiprolu on Tue, 24 Jun 2008 03:31:33 GMT
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PATCH[1/4]: Support-multiple-pipe-test-cases.patch
PATCH[2/4]: Testcase-3-continous-read-write-to-pipe.patch
PATCH[3/4]: Test4-Non-consecutive-pipe-fds.patch
PATCH[4/4]: Test-5-Read-write-using-dup-of-pipe-fds.patch

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Subject: [PATCH 1/4]: Support multiple pipe test cases
Posted by Sukadev Bhattiprolu on Tue, 24 Jun 2008 03:32:39 GMT
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```
>From a99deb9bcdd611c52589fa733dd90057f1f134bf Mon Sep 17 00:00:00 2001
From: Sukadev Bhattiprolu <sukadev@linux.vnet.ibm.com>
Date: Sun, 22 Jun 2008 21:05:48 -0700
Subject: [PATCH] Support multiple pipe test cases

Modify pipe.c to support multiple test cases and to select a test case
using the -t option.

Implement two tests:
 - empty pipe
 - single write to pipe followed by continous read
---
 tests/pipe.c |   93 +++++++++++++++++++++++++++++++++++++++++++++-----------
 1 files changed, 75 insertions(+), 18 deletions(-)

diff --git a/tests/pipe.c b/tests/pipe.c
index 0812cb3..76be6cc 100644
--- a/tests/pipe.c
+++ b/tests/pipe.c
@@ -1,52 +1,109 @@
 #include <stdio.h>
 #include <sys/types.h>
+#include <sys/fcntl.h>
 #include <unistd.h>
 #include <stdlib.h>
 #include <string.h>
 #include <errno.h>
-#include <sys/fcntl.h>

-int main(int argc, char *argv[])
```

```
+char *test_descriptions[] = {
+ NULL,
+ "Test with an empty pipe",
+ "Test with single-write to and continous read from a pipe",
+ "Test continous reads/writes from pipe",
+ "Test non-consecutive pipe-fds",
+ "Test with read-fd > write-fd",
+ "Test with read-fd/write-fd swapped",
+ "Test with all-fds in use",
+ "Test with all-fds in use for pipes",
+};
+
+static int last_num = 2;
+usage(char *argv[])
+{
+ int i;
+ printf("Usage: %s -t <test-number>\n", argv[0]);
+ printf("\t where <test-number is in range 1..%d\n", last_num);
+ for (i = 0; i < last_num; i++)
+  printf("\t test-%d: %s\n", i, test_descriptions[i]);
+ exit(1);
+}
+
+int test1()
 {
  int i = 0;
- int rc;
  int fds[2];
+
+ if (pipe(fds) < 0) {
+  perror("pipe()");
+  exit(1);
+ }
+
+ printf("Running as %d\n", getpid());
+ while (i<100) {
+  sleep(1);
+  printf("i is %d (pid %d)\n", i, getpid());
+  i++;
+ }
+}
+
+int test2()
+{
+ int i = 0;
  int c;
- int empty;
+ int rc;
```

```
+ int fds[2];
  char *buf = "abcdefghijklmnopqrstuvwxyz";

- /*
-  * -e: test with an empty pipe
-  */
- empty = 0;
- if (argc > 1 && strcmp(argv[1], "-e") == 0)
-  empty = 1;
-
  if (pipe(fds) < 0) {
   perror("pipe()");
   exit(1);
  }

- if (!empty)
-  write(fds[1], buf, strlen(buf));
+ write(fds[1], buf, strlen(buf));

  if (fcntl(fds[0], F_SETFL, O_NONBLOCK) < 0) {
   perror("fcntl()");
   exit(1);
  }
+
  printf("Running as %d\n", getpid());
  while (i<100) {
   sleep(1);
   if (i%5 == 0) {
    c = errno = 0;
    rc = read(fds[0], &c, 1);
-   if (rc != 1) {
-    perror("read() failed");
-   }
-   printf("i is %d (pid %d), c is %c\n", i, getpid(), c);
-
+   if (rc != 1)
+    perror("read() pipe failed\n");
+   printf("i is %d (pid %d), next byte is %d\n", i,
+     getpid(), c);
   }
   i++;
  }
 }

+int
+main(int argc, char *argv[])
+{
+ int c;
```

```
+ int tc_num;
+
+ while((c = getopt(argc, argv, "t:")) != EOF) {
+  switch(c) {
+  case 't':
+   tc_num = atoi(optarg);
+   break;
+  default:
+   printf("Unknown option %c\n", c);
+   usage(argv);
+  }
+ }
+
+ switch(tc_num) {
+ case 1: test1(); break;
+ case 2: test2(); break;
+ default:
+  printf("Unsupported test case %d\n", tc_num);
+  usage(argv);
+ }
+}
--
1.5.2.5
```

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Subject: [PATCH 2/4]: Test3: continous read/write to pipe
Posted by Sukadev Bhattiprolu on Tue, 24 Jun 2008 03:33:25 GMT
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```
>From ade1b719f7d9968e0f934daf736ca1746cb6747d Mon Sep 17 00:00:00 2001
From: Sukadev Bhattiprolu <sukadev@linux.vnet.ibm.com>
Date: Sun, 22 Jun 2008 22:26:18 -0700
Subject: [PATCH] Testcase 3: continous read/write to pipe

---
 tests/pipe.c |   82 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++-
 1 files changed, 81 insertions(+), 1 deletions(-)

diff --git a/tests/pipe.c b/tests/pipe.c
index 76be6cc..c81ac2a 100644
--- a/tests/pipe.c
+++ b/tests/pipe.c
@@ -6,6 +6,8 @@
```

```
 #include <string.h>
 #include <errno.h>

+#define min(a, b) ((a) < (b) ? (a) : (b))
+static char *temp_file;
 char *test_descriptions[] = {
  NULL,
  "Test with an empty pipe",
@@ -18,7 +20,7 @@ char *test_descriptions[] = {
  "Test with all-fds in use for pipes",
 };

-static int last_num = 2;
+static int last_num = 3;
 usage(char *argv[])
 {
  int i;
@@ -82,12 +84,89 @@ int test2()
  }
 }

+int read_write_pipe()
+{
+ int i = 0;
+ int rc;
+ int fds[2];
+ int fd1, fd2;
+ int c;
+ char *wbufp;
+ char wbuf[256];
+ char rbuf[256];
+ char *rbufp;
+
+ rbufp = &rbuf[0];
+ wbufp = &wbuf[0];
+
+ strcpy(wbufp, "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ");
+ memset(rbufp, '\0', sizeof(rbuf));
+
+ if (pipe(fds) < 0) {
+  perror("pipe()");
+  exit(1);
+ }
+ printf("fds[0] %d, fds[1] %d\n", fds[0], fds[1]);
+
+ if (fcntl(fds[0], F_SETFL, O_NONBLOCK) < 0) {
+  perror("fcntl()");
+  exit(1);
```

```
+ }
+
+ printf("Running as %d\n", getpid());
+ for (i = 0; i < 50; i++) {
+  sleep(1);
+  if (i%2 == 0) {
+   c = errno = 0;
+   rc = read(fds[0], rbufp, 3);
+
+   if (rc < 0)
+    perror("read() failed");
+   else {
+    printf("i is %d (pid %d), rbufp %p read %s\n",
+      i, getpid(), rbufp, rbufp);
+    rbufp += rc;
+   }
+
+   if (*wbufp == '\0')
+    continue;
+
+   errno = 0;
+   rc = write(fds[1], wbufp, min(3, strlen(wbufp)));
+   if (rc < 0) {
+    perror("write() to pipe");
+   } else {
+    if (rc != 3) {
+     printf("Wrote %d of 3 bytes, "
+      "error %d\n", rc, errno);
+    }
+    wbufp += rc;
+   }
+  }
+ }
+
+ if (strncmp(wbuf, rbuf, strlen(wbufp))) {
+  printf("Wrote: %s\n", wbuf);
+  printf("Read : %s\n", rbuf);
+  printf("Test FAILED\n");
+ } else {
+  printf("Test passed\n");
+ }
+}
+
+static void test3()
+{
+ read_write_pipe();
+}
+
```

```
 int
 main(int argc, char *argv[])
 {
  int c;
  int tc_num;

+ temp_file = argv[0];
+
  while((c = getopt(argc, argv, "t:")) != EOF) {
   switch(c) {
   case 't':
@@ -102,6 +181,7 @@ main(int argc, char *argv[])
  switch(tc_num) {
  case 1: test1(); break;
  case 2: test2(); break;
+ case 3: test3(); break;
  default:
   printf("Unsupported test case %d\n", tc_num);
   usage(argv);
--
1.5.2.5
```

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Subject: [PATCH 3/4][cryo]: Test 4: Non-consecutive pipe fds
Posted by Sukadev Bhattiprolu on Tue, 24 Jun 2008 03:34:12 GMT
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```
>From c7276c8cb59247faa13d42a1b871c853a80d80d1 Mon Sep 17 00:00:00 2001
From: Sukadev Bhattiprolu <sukadev@linux.vnet.ibm.com>
Date: Sun, 22 Jun 2008 22:43:01 -0700
Subject: [PATCH] Test4: Non-consecutive pipe fds

---
 tests/pipe.c |   76 ++++++++++++++++++++++++++++++++++++++++++++++++++-------
 1 files changed, 66 insertions(+), 10 deletions(-)

diff --git a/tests/pipe.c b/tests/pipe.c
index c81ac2a..5b04f46 100644
--- a/tests/pipe.c
+++ b/tests/pipe.c
@@ -5,6 +5,7 @@
 #include <stdlib.h>
 #include <string.h>
```

```
 #include <errno.h>
+#include <sys/stat.h>

 #define min(a, b) ((a) < (b) ? (a) : (b))
 static char *temp_file;
@@ -20,7 +21,7 @@ char *test_descriptions[] = {
  "Test with all-fds in use for pipes",
 };

-static int last_num = 3;
+static int last_num = 4;
 usage(char *argv[])
 {
  int i;
@@ -84,13 +85,50 @@ int test2()
  }
 }

-int read_write_pipe()
+
+reset_pipe_fds(int *tmpfds, int *testfds, int close_unused)
+{
+ struct stat statbuf;
+ int rc;
+
+ if (fstat(testfds[0], &statbuf) == 0) {
+  printf("fd %d is in use...\n", testfds[0]);
+  exit(1);
+ }
+ if (fstat(testfds[1], &statbuf) == 0) {
+  printf("fd %d is in use...\n", testfds[1]);
+  exit(1);
+ }
+
+ rc = dup2(tmpfds[0], testfds[0]);
+ if (rc < 0) {
+  printf("dup2(%d, %d) failed, error %d\n",
+    tmpfds[0], testfds[0], rc, errno);
+  exit(1);
+ }
+
+ rc = dup2(tmpfds[1], testfds[1]);
+ if (rc < 0) {
+  printf("dup2(%d, %d) failed, error %d\n",
+    tmpfds[1], testfds[1], rc, errno);
+  exit(1);
+ }
+
```

```
+ if (close_unused) {
+  close(tmpfds[0]);
+  close(tmpfds[1]);
+ }
+}
+
+#define TEST_NON_CONSECUTIVE_FD 0x1
+
+int read_write_pipe(int *testfdsp, int close_unused)
 {
  int i = 0;
  int rc;
- int fds[2];
- int fd1, fd2;
+ int tmpfds[2];
  int c;
+ int read_fd, write_fd;
  char *wbufp;
  char wbuf[256];
  char rbuf[256];
@@ -102,13 +140,23 @@ int read_write_pipe()
  strcpy(wbufp, "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ");
  memset(rbufp, '\0', sizeof(rbuf));

- if (pipe(fds) < 0) {
+ if (pipe(tmpfds) < 0) {
   perror("pipe()");
   exit(1);
  }
- printf("fds[0] %d, fds[1] %d\n", fds[0], fds[1]);

- if (fcntl(fds[0], F_SETFL, O_NONBLOCK) < 0) {
+ if (testfdsp) {
+  reset_pipe_fds(tmpfds, testfdsp, close_unused);
+  read_fd = testfdsp[0];
+  write_fd = testfdsp[1];
+ } else {
+  read_fd = tmpfds[0];
+  write_fd = tmpfds[1];
+ }
+
+ printf("read_fd %d, write_fd %d\n", read_fd, write_fd);
+
+ if (fcntl(read_fd, F_SETFL, O_NONBLOCK) < 0) {
   perror("fcntl()");
   exit(1);
  }
@@ -118,7 +166,7 @@ int read_write_pipe()
```

```
   sleep(1);
   if (i%2 == 0) {
    c = errno = 0;
-   rc = read(fds[0], rbufp, 3);
+   rc = read(read_fd, rbufp, 3);

    if (rc < 0)
     perror("read() failed");
@@ -132,7 +180,7 @@ int read_write_pipe()
     continue;

    errno = 0;
-   rc = write(fds[1], wbufp, min(3, strlen(wbufp)));
+   rc = write(write_fd, wbufp, min(3, strlen(wbufp)));
    if (rc < 0) {
     perror("write() to pipe");
    } else {
@@ -156,7 +204,14 @@ int read_write_pipe()

 static void test3()
 {
- read_write_pipe();
+ read_write_pipe(NULL, 1);
+}
+
+static void test4()
+{
+ int tmpfds[2] = { 172, 101 };
+
+ read_write_pipe(tmpfds, 1);
 }

 int
@@ -182,6 +237,7 @@ main(int argc, char *argv[])
  case 1: test1(); break;
  case 2: test2(); break;
  case 3: test3(); break;
+ case 4: test4(); break;
  default:
   printf("Unsupported test case %d\n", tc_num);
   usage(argv);
--
1.5.2.5
```

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Subject: [PATCH 4/4][cryo]: Test 5: Read/write using dup() of pipe fds
Posted by Sukadev Bhattiprolu on Tue, 24 Jun 2008 03:34:54 GMT
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>From 121c33ebe1ae201d5bb051f9c76e3eaae29329bb Mon Sep 17 00:00:00 2001
From: Sukadev Bhattiprolu <sukadev@linux.vnet.ibm.com>
Date: Sun, 22 Jun 2008 23:33:24 -0700
Subject: [PATCH] Test 5: Read/write using dup() of pipe fds

---
 tests/pipe.c | 19 +++++++++++++++-----
 1 files changed, 14 insertions(+), 5 deletions(-)

diff --git a/tests/pipe.c b/tests/pipe.c
index 5b04f46..47f5da6 100644
--- a/tests/pipe.c
+++ b/tests/pipe.c
@@ -16,12 +16,13 @@ char *test_descriptions[] = {
  "Test continous reads/writes from pipe",
  "Test non-consecutive pipe-fds",
  "Test with read-fd > write-fd",
+ "Test with dup of pipe fds around"
  "Test with read-fd/write-fd swapped",
  "Test with all-fds in use",
  "Test with all-fds in use for pipes",
 };

-static int last_num = 4;
+static int last_num = 5;
 usage(char *argv[])
 {
  int i;
@@ -145,13 +146,13 @@ int read_write_pipe(int *testfdsp, int close_unused)
   exit(1);
  }

+ read_fd = tmpfds[0];
+ write_fd = tmpfds[1];
  if (testfdsp) {
   reset_pipe_fds(tmpfds, testfdsp, close_unused);
+ /* read from dup'd fds even if main ones are open */
   read_fd = testfdsp[0];
   write_fd = testfdsp[1];
- } else {
- read_fd = tmpfds[0];
- write_fd = tmpfds[1];
  }

  printf("read_fd %d, write_fd %d\n", read_fd, write_fd);

```
@@ -193,7 +194,7 @@ int read_write_pipe(int *testfdsp, int close_unused)
   }
  }

- if (strncmp(wbuf, rbuf, strlen(wbufp))) {
+ if (strncmp(wbuf, rbuf, strlen(wbuf))) {
   printf("Wrote: %s\n", wbuf);
   printf("Read : %s\n", rbuf);
   printf("Test FAILED\n");
@@ -214,6 +215,13 @@ static void test4()
  read_write_pipe(tmpfds, 1);
 }

+static void test5()
+{
+ int tmpfds[2] = { 172, 101 };
+
+ read_write_pipe(tmpfds, 0);
+}
+
 int
 main(int argc, char *argv[])
 {
@@ -238,6 +246,7 @@ main(int argc, char *argv[])
  case 2: test2(); break;
  case 3: test3(); break;
  case 4: test4(); break;
+ case 5: test5(); break;
  default:
   printf("Unsupported test case %d\n", tc_num);
   usage(argv);
--
1.5.2.5
```

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